THE ZOOLOGIST

No. 749.—November, 1903.

THE HYBRIDIZATION OF *COLUMBA PALUMBUS.*

BY P. ST. M. PODMORE, F.R.G.S., M.A. (Camb.).

(PLATE VII.)

THE origin of species and their powers of hybridization are subjects of profound interest to all students of zoology. In the typical Lower Miocene beds of Allier and Puy-de-Dôme have been found an enormous number of ornitholites referring to nearly fifty species, including Colymboïdes, which may be placed in the Colymbidæ, and among existing genera—*Anas*, *Aquila*, *Bubo*, *Collocalia*, and *Columba*, &c. To prove the connecting-links between the Colymboïdes and the innumerable varieties of domestic Pigeons and wild Doves distributed over the globe would be an undertaking too gigantic for an ordinary lifetime.

Hybridization, so closely allied with evolution, is a study much neglected, and yet of the greatest importance. Zoologists realize this, and Prof. Newton remarked in a recent letter I received: "The subject of hybridism is a most attractive one"; and, again: "We, however, know very little about animal hybrids, and I wish more people would take up the subject."

The tendency to distribute one's energies over too vast an area, and the want of definite concentration, might account for much lack of success. If a number of enthusiasts were to unite their labours, each devoting a lifetime to one particular definite pursuit, and become associated in a school or college for the study of experimental results, science would make some rapid steps in advance.

The very limited area of my own studies, and the dogged determination to prove a personal theory regardless of time and labour, have contributed to my success. My original ambition was to produce a new variety of Pigeon that would not only prove the swiftest flying bird, but also the most useful adjunct for the table. To carry this out I ignored the existing varieties of *C. domesticus*, and turned my attention to the British wild Doves. During the past fifteen years I have reclaimed and bred hybrids from *C. palumbus*, *C. œnas*, *C. turtur*, and *C. livia*. These years of labour have been marked by many failures and disappointments. In addition to the weariness of working alone and without sympathy or recognition, I was confronted with the fact that no ornithologist whose writings I had consulted at the libraries of the universities and learned societies made any mention of the prolificness of Ring-Dove hybrids. Many doubted even the possibility of domesticating and hybridizing the bird, and all were agreed that such a bastard would prove barren and worthless.

Sir W. Jardine, in 'The Naturalist's Library,' remarks:—"For the bastard produce of the common Wild Turtle of the aviary (*C. risoria*) has been proved by frequent experiment to be barren, although the two species from whence it originates appear to be closely allied, and such we have no hesitation in saying would be the event if a cross could be obtained between the Common Pigeon and the Ring-Pigeon, the Wood-Pigeon, or any other species."

Comparing this statement with my own notes on the hybridization of *C. palumbus*, I quote the following:—

"During this year (1899) I became decidedly disheartened, having lost, from different pairs, no fewer than forty young birds, from causes that at the time appeared unaccountable"; and again, on 2nd August, 1899, I wrote: "Eleven days seem about the extent of life permitted to the young of this curious cross-breeding. Both birds that died to-day are well nourished, and bear the characteristics of the Wood-Pigeon, both in shape and plumage. This is the first time that both birds have lived so long. Last year, in each case, the hen died on the fifth day, and the cock on the eleventh." It happened, however, that just at the time when I was about to give up my experiments success arrived. In September, 1899, I reared a Ring-Dove hybrid that has proved one of the healthiest and hardiest of the Pigeon tribe. On 21st January, 1902, this bird was forwarded to me from 388, Bowery, New York. It arrived in excellent condition, and, notwithstanding nine months' absence, it recognized me again.

My letters, published in the 'Field' during 1897, and my subsequent articles, published by Mr. Upcott Gill, have brought me many interesting replies from different parts of the world. Some ornithologists had reared hybrids to the stage mentioned in my notes (1899), but it was only recently that I received the following:—"I read with pleasure your recent paper on the Wood-Pigeon hybrid. You may care to have the enclosed photograph of a hybrid youngster bred some twelve or fifteen years since. The parents of this bird were a red chequer Homer cock and a very tame hand-reared Ring-Dove hen. The hybrid is a light red chequer, taking after the hen bird in shape and size. I had some six or seven nests, but never more than one egg in a nest was fertile. The bird photographed was the only bird that lived until feathered. All the young were strong and apparently healthy birds," &c.

The photograph enclosed was unfortunately taken from a stuffed specimen, and therefore worthless for publication; but I deeply appreciated the kindness and interest of this gentleman, and invite any readers of 'The Zoologist' to write to me upon this subject.* Photographs of hybrids will always be acceptable, and possibly an exchange can be made.

A reference to the accompanying Plate may induce the most critical to acknowledge the success of my work. C is the hybrid bred September, 1899; B is mated to the hybrid, and the mother of the young bird A, now two months old. B is a long distance flying Homer. The position of the birds permits of comparison. The flight-feathers and general construction of the wings (A) would suggest both swiftness and endurance superior to B, and unequalled by any existing variety. This photograph was taken from life by Mr. David Eddy of St. Leonards-on-Sea, Oct. 16th, 1903.

---

* Letters addressed "The Zoological Society of London" will receive due attention, or I could arrange interviews between 12 p.m. to 1 p.m. on Mondays at the office.

Mr. M. Cox, writing from Alexandria, on May 29th, 1897, says: "Some eight years ago we tried hybridizing both the Stock-Dove and Wood-Pigeon with Homers, and succeeded in getting at least two pairs of young, but both pairs died from some unknown cause just after fledging." And, again, another suggests:—"Probably had I given the old birds a plentiful supply of green food with small unripe seed—such food as the Wood-Pigeon would obtain in a wild state—in place of the dry corn on which they were fed, I might have had more success in rearing hybrids."

Both Bechstein and Wallace "know of no result attending the mating of the Ring-Dove with the domestic Pigeon." Such statements as these from recently published books suggested this article to 'The Zoologist.' It may therefore be of interest to describe the history of the Ring-Dove hybrid. It was taken from the nest when only seven days old. I first mixed a little castor-oil in a bread-pill, as I had noted nearly all the birds had died from soured crop. After four hours I fed with a small piece of raw beefsteak reduced to a warm pulp, and administered in the smallest quantities so as to avoid internal irritation. Three hours after I gave freshly crushed lettuce-leaves, followed with warm crushed dari, wheat, and buckwheat, sprinkled sparingly with the grit tonic prepared by Hyde. Early the next morning I gave the bird a sulphur pill, continuing the treatment of the previous day, with the addition of a few seeds of linseed at night, over which boiling water had been poured. I found heated elder-berries were eagerly taken. Guided by the clearness of the eye, the general fledging and development, I continued judiciously the castor-oil pills, sulphur, and linseed, never neglecting fresh lettuce and a few grains of medicinal grit. The bird thrived wonderfully, became very tame, and in a month could fly. When he was three weeks old I fed him upon ordinary seed that had been soaked in warm water for about an hour, and the lettuce-leaves he pecked from my hand. This bird has shown much attachment to me, cooing at the sound of my voice, and flying to my hand or shoulder when summoned by a signal. He is the most affectionate bird I have ever possessed.

On April 12th, 1900, I made the following note:—"The Ring-Dove hybrid, now over six months old, has mated to a Blue Carrier hen. He was very fierce during the process of mating, and at one time I feared the hen would be pecked to death. His blows were delivered with beak and feet. He used the feet in a somewhat ridiculous fashion, taking short flights, and spurring the hen upon the back. This method of bullying deprived her of many feathers, and caused me ultimately to separate them.

While building the nest the hybrid made many fruitless attempts to place the twigs crosswise over the perch, taking the material in his beak, and lowering the head until it was in line with the breast-bone. A fan-like spreading of the tail was observable after a short flight towards his mate.

The Ring-Dove hybrid had a curious habit of twisting his body playfully in mid-air while flying for exercise in the conservatory. This attitude recalled to mind the remarkable twist of the wild Ring-Dove when turning in swift flight from a suspicious-looking danger spot. When alighting he would open wide the shoulders of his wings, and spread the tail-feathers widely apart. While paying court to his mate the beak was opened and closed several times, and the feathers of the neck raised. The note after mating was uttered very loudly twice, instead of three times, as with the Ring-Dove. The note of the bird is a curious mixture of both parents. When enticing the hen to nest it is somewhat similar to the grating sound of the Stock-Dove, but when paying addresses to the hen he has a curious custom of taking short hops, and then bowing the head, inflating the chest and spreading the tail in mid-air like the Ring-Dove cock."

Prof. Newton, in his admirable 'Dictionary of Birds,' p. 162, says:— "No sharp distinction can be drawn between Pigeons and Doves, and in general literature the two words are used almost indifferently, while no one species can be pointed out to which the word Dove, taken alone, seems to be absolutely proper." Valuing as I do the learning and kind sympathy of this celebrated zoologist, it would be presumptuous on my part to take exception to the above quotation. This I will not do, but merely state that I personally have observed a marked distinction between the Pigeon and Dove that appears to apply to the wild varieties of America, Australia, and India, &c., as well as to the British species. For example, observe their gestures during the process of mating. A Dove bows the head, inflates the breast, and expands the tail in air. The Pigeon moves the body in circles, and sweeps the ground with his expanded tail. If I were asked to distinguish between a Dove and a Pigeon unscientifically, I should say, "A Dove bows to his lady-love, but a Pigeon turns his back upon her"; or, "A Dove jumps with delight when he is rewarded with reciprocated affection, whilst a Pigeon merely sweeps his mate along the path of love, ignoring her preferences in the matter." Therefore the British *Columbidæ* would consist of Ring-Dove, Stock-Dove, Turtle-Dove, and Rock-Pigeon. My present knowledge of comparative structural anatomy restrains me from drawing scientific distinctions, but possibly mere observations may in course of time become confirmed by facts.

ON SEXUAL SELECTION AND THE ÆSTHETIC SENSE IN BIRDS.

By H. E. Howard, F.Z.S.

Peculiarities in the development of the plumage of different birds, together with eccentricities of behaviour during the mating period, which from time to time have come under my notice, have raised doubts in my mind as to the efficiency of sexual selection—in the way in which Mr. Darwin interpreted it—to account for phenomena in the development of plumage, &c., to which it has been applied. Mr. Darwin, in his 'Descent of Man,' has paid much attention to the colours of birds, their plumage, and its display at the pairing season; and it is on this latter circumstance that he founds his theory, that both the plumage and the colours have been developed by the preference of the females, the more ornamented males becoming the parents of each successive generation. Many cases of the actual display are given, nearly all of which are in reference to species in foreign countries; those that do refer to this country are on the evidence of one observer, and on species kept in confinement. I therefore propose to give more or less in detail—and it is necessary for the purposes of my argument—cases of actual display amongst some of our native species. I feel convinced that, if it were not for the difficulties inseparable from watching a display so quickly executed, some such display as I am about to relate would be found to be inherent in the males, occasionally perhaps in the females, of all species.

The males then, as I have seen them, have three different ways in which they can display their beauties to the female: they can display the colours of their plumage and any special ornaments which they possess, they can display their vocal powers, and they can display the beauties of their form; this latter perhaps needs some explanation. The most perfect development of plumage amongst all birds is reached in the spring, immediately preceding actual pairing; it will then be found that the colours of the feathers and the feathers themselves are in the most perfect condition—a condition which is absolutely essential if the form is to be perfect—and therefore, I think, it will be understood that if a feather is missing, or if the feathers are abraded and not their proper length, the lines as lines of beauty must necessarily be imperfect. This state of perfection is, as a rule, of very short duration; practically it only exists between the time at which the full development for the season is reached and the time at which the actual pairing takes place—that is to say, during the period in which the display of beauty is essential. I have noticed in the case of many different species—and therefore by analogy the same fact may probably be assumed to occur amongst all—that within a few hours after actual pairing has taken place the colours of the plumage begin to fade; and it must be common knowledge to those who have in any way interested themselves in birds, that within a few weeks of this time—as a result of the fading of the colours and the abrasion of the feathers—all intrinsic beauty may be said to have vanished. Amongst those birds in whom the power of song is exceedingly developed, in addition to the display of their vocal powers, there is to some extent a display of their plumage. Such an one is the Blackcap (*Sylvia atricapilla*). Two males, as a rule, pursue the female, singing intermittently, the song at this time being far superior to the song at other times; when very near the female the song subsides to a very beautiful warble, the notes being very rich; the feathers at the same time are thrown out all over the body, the tail being sometimes carried almost at right angles to the body. The Garden Warbler (*S. hortensis*) acts in much the same way, only in this case all the powers of the bird seem to be even more devoted to song. The male Nightingale hops about in front of the female, flirting his tail, the feathers being thrown out all over the body, the bright patch above the tail showing very strikingly, especially, as is frequently the case, when the display takes place under bushes in a subdued light.

Two or more males pursue the female Chiffchaff (*Phylloscopus rufus*). When near the female the male throws out his feathers all over his body, drops his wings rather loosely, spreads out his tail, and slowly waves it from side to side. The Lesser Whitethroat (*Sylvia curruca*) acts in much the same manner as the Chiffchaff; the tail is spread out and slowly waved from side to side; the tail, however, in this case is, when spread out, very beautiful.

The Grasshopper-Warbler (*Locustella nævia*) always interested me, as the male always appears to take more care than the males of other species in the display of his plumage. The female walks on the ground; the male follows, spreading out his wings and tail to the full, raising the feathers on his head and back, and throwing them out on his breast, meanwhile flapping his wings slowly up and down, and when in this position he frequently walks along the lowest branches of some small bush. In order to appreciate the effect the display must be seen. The male Stonechat (*Pratincola rubicola*), perched on the top of a whin-bush, jerks his tail almost at right angles to the body, drops his wings in order to show the conspicuous white wing-coverts, and sings vigorously, at times mimicking other birds. The Greenfinch turns from side to side on a branch with wings and tail outspread. The Sky-Lark raises his tail, and bows to the female, the feathers on the body being thrown out in the same manner as those mentioned previously. The Lesser Spotted Woodpeckers (*Dendrocopus minor*) at this period make a great commotion, and their display is very pretty. They spread their wings out to the full extent, and slowly flap through the air; this, I have little doubt, is only part of the display, but the Woodpeckers are a difficult class of birds to watch when courting. The male Blue Tit performs in the same way, extending his wings and slowly flapping about. It is interesting to notice that in these last two cases, in which the display is to some extent different, the wings, when fully extended, are very beautiful, and would make rather an imposing spectacle. Whether the males in these cases are conscious of the beauty of their wings forms the subject of this article. These two cases seem to point to some such conclusion as being probable; yet, in the case of the Grasshopper-Warbler previously cited, the wings are spread out, although there are no special markings to be shown to advantage. The rapid descent of the Snipe, which through specially formed feathers in the tail causes a peculiar vibrating sound, the soaring and the singing of the Lark, and the dances of various birds, are frequently placed in the same category as the display of plumage; but inasmuch as the Snipe performs his flight, and the Lark soars and sings, after the young are hatched, I do not see how such actions can be connected with the display used only for a short period for the purpose of courtship. It is indeed a difficult matter to discriminate between the display which takes place during courtship and the display at certain periods after the birds are paired. A display of this latter kind can frequently be seen among many different species, especially among the *Columbidæ.* Wood-Pigeons, Stock-Doves, and Turtle-Doves raise their tails, lower their heads, distend their throats, and utter a peculiar cooing sound; Finches go through a peculiar dancing movement, but such actions as these must not be confused with the display used preceding pairing. The fact that a large proportion of the examples I have given belong to the *Sylviinæ* may cause remark; the reason is, that being specially interested in the various species belonging to this order, and having ample opportunities for watching, I have given them more attention.

The advantages claimed by Mr. Darwin as likely to accrue to the offspring of those males which proved through sexual selection attractive to the females, always appeared to me to constitute a very great difficulty—a difficulty which does not usually appear to have been fully recognized, although, as will be seen from the following passage in the 'Descent of Man,' fully recognized by Mr. Darwin himself. He says:—"Our difficulty in regard to sexual selection lies in understanding how it is that the males which conquer other males, or those which prove the most attractive to the females, leave a greater number of offspring to inherit their superiority than their beaten and less attractive rivals. Unless this result does follow, the characters which give to certain males an advantage over others could not be perfected and augmented through sexual selection." Instances are brought forward to prove that the courtship is of long duration. Such instances are the leks of the Blackcock in Germany and Scandinavia, which last from the middle of March into May, and the leks of the Capercailzie, which last from the end of March to the end of May; in North America the Partridge dances of *Tetrao phasianellus* last for a month or more, &c. No evidence, however, is adduced to prove that selection by the female is being carried on during the whole of this period, and that such should be the case is highly improbable, for if, as must be so, both sexes are in a fit condition to breed during the whole of this period, considerable and valuable time will have lapsed before any choice on the part of the female takes place; such loss of time, owing to reasons which must be apparent, could only result in being the reverse of beneficial to the species, and contrary to the laws of natural selection. But apart from such a consideration as the above, I cannot call to mind a single instance in which the selection has taken more than a very short period; sometimes it is a day or so, frequently only a matter of hours, and with migratory species the duration of this period appears to vary to some extent with the condition of the seasons. For these reasons I am convinced that the selection is usually of short duration, and, this being the case, it will readily be seen what a difficult matter it becomes to understand in what direction the young of those individuals that were first paired could gain any advantage; food being as plentiful for the late as the early broods. Whether, amongst those species which rear two or more broods, the fact of one pair of individuals commencing to breed a few hours before another could be of any advantage is very doubtful; on the other hand, a very large number of species do not rear two broods. I fully admit that an advantage, however small, when maintained over such a vast period, must be effective, but in this case I cannot see where the advantage lies; and, on the contrary, it might frequently happen, owing to adverse climatic conditions at the time when the young are hatched, that the young of those individuals that were the later breeders might thus have an advantage. Mr. Wallace, however, has pointed out an objection which makes it almost impossible to believe that sexual selection can act in the way in which Mr. Darwin interpreted it. Briefly it is this: that the extremely rigid action of natural selection must render any attempt to select mere ornament utterly nugatory, unless the most ornamented always coincide with the fittest in other respects; and if such is the case, then no other kind of selection is necessary. The force of such an objection will at once be seen.

In the same work Mr. Wallace gives his reasons for regarding the display of the male solely as a sign of vigour and health, and thereby attractive to the female, and finally denies any æsthetic sense to the female. He says:—"We have thus no reason for imputing to her any of those æsthetic emotions which are excited in us by the beauty of form, colour, &c., or the still more improbable æsthetic tastes which would cause her to choose a mate on account of minute differences in their forms, colours, &c." Here I am unable to follow him. As natural selection continually acts for the future good of a species, it is evident that in order to attain this end a healthy female is as essential as a healthy male, and therefore those females which are first ready to breed, and before whom the males display their plumage, must be in a healthy and fit condition; if the reverse were the case, and an unhealthy female had as great a chance of securing a mate as a healthy one, then such a theory as Mr. Wallace puts forward would become untenable. But the evidence in support of such a supposition is strong. The females of all the migratory species arrive after the males, the interval between the sexes varying in different species. The arrival of the females is spread over some days; at first they come sparingly, but later increase rapidly. Among the Ducks, a female desires to choose a mate; to her all the drakes pay homage, regardless of other females round, who in their turn are apparently disinterested spectators of the display of the males. Natural selection therefore has probably implanted in the female a faculty whereby she becomes conscious of the fact that she is in a healthy and fit condition to breed. According, then, to Mr. Wallace, in order to obtain the same result attained in the female, natural selection has caused the males to go through an elaborate display, and in addition has developed in the female the power of selecting the most vigorous male. Surely this is a fallacy. It would have been a far more simple process, and one more in keeping with the working of natural selection, as we know it, if the same power developed in the female had also been developed in the male; and supposing such were the case, then, no explanation is afforded by such a theory for the display. There is another objection directly arising out of this theory, which alone makes it almost inconceivable that colours, &c., could have been developed in this manner. It is this: that if all plumes, colours, song, and form are due to a surplus vital energy, and their development to the preference shown by the female for the healthiest male, then how is it possible that health and vigour alone could have developed that wonderful harmony of colour, &c., which we call beautiful? Birds might have developed into ungainly creatures, our most beautiful songsters might have developed shrieks; and yet, if Mr. Wallace's theory is accepted, such a development as I have indicated would have served the purpose of natural selection equally as well, in that it would have been just as much a sign to the female of health and vigour in the male. From the beauty of the colours previously referred to, and from the harmony with which variations tend to develop, it is evident that there is in nature some direct power continually at work fostering and developing all that is beautiful. As touching on the question of song, it is a curious fact that I have never heard the male Blackcap while mating attempt to mimic other species; yet, during July, I have heard him mimic—and mimic the Nightingale exceedingly well. It must be as great—probably a greater—effort on the part of a bird to mimic than to sing its natural song, and therefore, in this case, it seems to point to some other power, beyond mere vigour and health, immanent in the bird, which gives it control over its vocal powers, and in this respect it supports my general argument.

What, then, is the explanation of this display? For some years I have been impressed with the exceeding variation in plumage, and song, amongst individuals of the same species, and I have come to regard these variations as coincident with the age of the individual. I cannot call to mind any instance amongst our common species in which this variation does not to some extent occur. A few examples will illustrate my meaning. The vinous tint on the breast of the Whitethroat varies considerably; the older males possess it in a marked degree, while in some of the younger birds it can with difficulty be traced; the older males also have brighter grey on the head and neck, and much more intense fawn on the flanks. The male Grasshopper-Warbler is generally described as having dark spots on the neck; the older males do not possess these spots, but have instead a rich fawn-colour; they also have a much purer white on the belly than the younger bird.

The old Blackcaps have a much finer song than the younger birds, and in addition have much finer plumage; the feathers on the belly are a much purer white, the back is more olive-green, and the eyelid is much whiter. The Wood-Warbler shows very great variation, but here the colours are so delicate that a description is almost impossible; the different shades of green, however, are much more intensified in the older birds. The Stonechat affords an excellent illustration, especially as several pairs are frequently close together, and allow of comparison. As a rule the feathers of the back are edged with black; sometimes, in birds of the first year, they can hardly be said to show any black at all. In the old birds, however, the back may be said to be as black as the head, and in addition the rufous colour of the breast is much deeper, and the belly a much purer white. The Brambling in winter is another good illustration, because the different grades of colouring are so marked; the old males have the head and back a much deeper black, and the breast a more intense red. The old male Yellowhammers are marked with a much more intense yellow, especially on the head. In many cases also the feathers are longer, consequently the form is more perfect. A development of the same kind takes place in the song of many birds; the Blackbird is most noticeable, and the attempts of the younger birds can be easily picked out, such attempts being often very feeble. Here, then, we have firm ground on which a theory can be based, *i. e.* that the tendency for the colours to become more intensified, and the plumage and song more perfect, is proportionate to the age of the individual. Such a tendency could not exist without motive on the one hand, and support on the other; this support is, I believe, supplied by æsthetic sense. If, as a bird matures, it becomes more beautiful, what reason, it may be asked, can there be for any display? What necessity for any other power? I wish, however, to show that such beauty is not solely dependent on age, but must necessarily be subservient to some other power. Those who have studied sexual selection amongst any species will understand how difficult it is to happen to be present when the final selection takes place, and therefore to place on record specific cases as proof of the most perfect males being chosen is a most difficult task. I can, however, in the case of the Stonechat, affirm that I have seen the finest old males first paired. Under such conditions, where the older and more beautiful males prove more attractive to the females, any theory which is primarily based on supposed advantages gained by a male, which, having through some slight variation proved more attractive, is first paired, and which includes the transmission of such a variation to the offspring, making them in their turn more attractive to the females, inasmuch as such offspring in competition with more mature males would not be first selected, becomes untenable. I have already given my reasons for concluding that all the males which are competing for a female are in an equally healthy and vigorous condition; natural selection, therefore, at this point, as far as the future of the species is concerned, has done its work, and beyond this point sexual selection comes into play for the development for beauty only. In proportion as each successive season a male develops and sees the advantages that accrue from such development, so will the desire for further development increase; when the limit of such development is reached, variations will tend to occur—I use the word variation for want of a better; exceeding development expresses my meaning more clearly—such variations will be transmitted to the offspring, and will appear and be developed as the young matures.

Very little appears to be known concerning the age at which a bird commences to breed; this much, however, we do know—that there are yearly great numbers of individuals that do not breed, and the evidence seems to show that such individuals are immature. We have then a gradual process of development, amongst the healthy individuals of a species, due to the action of inherent æsthetic sense in combination with a tendency for the plumage to develop with age, on exactly similar lines—and that this development should be as perfect as possible, a careful display of the male is essential.

One of the arguments used against Mr. Darwin's theory of sexual selection was that it was improbable that females in different places should have chosen the same variation; but here such an argument could not be used, inasmuch as variations are due to continuous laws of growth, and only developed by inherent æsthetic sense. The plumage of the female develops with maturity in the same manner as that of the male. In the female, however, the colours are, as a rule, duller, and proportionately as they are duller, the variations at different stages of maturity are less striking; in addition to this the plumage is not developed to such an extent, and consequently the form of the bird is less perfect. These facts appear to support my theory. The tendency to develop is there, but, inasmuch as the males court the females, and not the females the males, the rivalry, which on this account exists amongst the males, is unnecessary among the females; consequently the power, which acts as a stimulant to further development of the plumage of the male, is absent in the case of the female.

Mr. Darwin, in his 'Descent of Man,' mentions various cases in which the females are brighter than the males, and concludes that in these cases the order is changed, and that instead of the females selecting the males, the males select the females. In so far as it is due to the selection of one sex by the other being reversed, I agree with him; but, as I have previously pointed out, I differ from him in the manner in which sexual selection works.

It will be seen, then, that my suggested explanation of the display and selection differs very materially from others; more especially in this fact, that it is not based on direct advantages gained by the offspring of the most successful males, but on the natural development of inherited laws of growth; and, in addition, it regards the action of sexual selection, together with this tendency to develop with age, solely as a means for the development of beauty. In contemplating animated nature we see a development of beauty so marvellous that we can only conclude that such a development must have been equally as important in the history of the world as the development of the fittest in other respects.

We see in man the æsthetic sense developed to the highest degree, and if we regard that higher idea of creation, which the word Evolution embraces, as applicable to man, then we must look upon this sense as having been dependent on a very modest origin. To deny, therefore, to the lower animals a sense in proportion to their development seems to me inconsistent with the whole theory of evolution. The origin of this sense, and of beauty, remains—despite the lengths to which the Weismann conception of natural selection has taken us—as great a mystery as ever. Creative power—that power which evolution reveals at every turn—can alone supply an answer. It is difficult to understand how such a condition of thought could have arisen, which, while admitting the principle of evolution, denied the possibility of creative power. Such questions as have here been discussed, together with others of equal interest, can only be solved by the closest study of animal life. By life I do not mean death. This may sound paradoxical, but it is none the less true; for, until it comes to be recognized that the knowledge of the working and development of the mind of an animal is of greater importance than the knowledge of the body—is the human mind considered of little importance?—the solution of such questions will remain in doubt, and no progress will be made towards supplying an answer to the great mystery alluded to in the following beautiful lines:—

> "Flower in the crannied wall,
> I pluck you out of the crannies;
> I hold you here, root and all, in my hand,
> Little flower—but if I could understand
> What you are, root and all, and all in all,
> I should know what God and man is."

SOME NOTES OF RARE BIRDS FROM KENT AND SUSSEX.

By N. F. Ticehurst, M.A., M.B.O.U.

The past twelvemonth has been so remarkable in its production of rare birds in this district (*i. e.* S.W. Kent and S.E. Sussex) that it seems well worth while to bring together all the records that I have been able to collect during that time.

It would seem that the conditions were particularly favourable last autumn for staying the birds on this coast during their migration, and, though I was unable myself to make many observations, I certainly heard the birds passing over at night in apparently greater numbers than usual. Wagtails, both Yellow and Blue-headed, as well as the Pied, lingered longer than usual, and several Pied Flycatchers and Black Redstarts were observed. Of the waders, certainly more than the usual numbers of Little Stints, Curlew-Sandpipers, Knots, Reeves, and Dotterel—all rather rare birds on this coast—were seen and obtained.

In the following list will be noticed the occurrence in this district of no fewer than three species for the first time in this country, *viz.* the White-spotted Bluethroat, the Black-headed Wagtail, and the Black-winged Pratincole. For the majority of the specimens I am indebted to Mr. Bristow, the well-known taxidermist of St. Leonards-on-Sea, for permission to examine and record them. Where they have been previously recorded, I have given the reference, so that there may be no confusion if any future workers want to make use of the records.

August 8*th*, 1902.—Aquatic Warbler (*Acrocephalus aquaticus*), male, shot on the military canal at Winchelsea.

11*th*.—A female shot at the same place. This pair, the fifth and sixth examples that have been recorded in this country, were exhibited at the British Ornithologists' Club on Oct. 22nd, 1902, by T. L. Bonhote, Esq. (*vide* Bull. B. O. C. xci.).

September 22*nd.*—A young male Rustic Bunting (*Emberiza rustica*) shot at Westfield. It was seen by my brother in the flesh, and exhibited by me at the British Ornithologists' Club, Oct. 22nd, 1902 (*vide* Bull. B. O. C. xci.). This is the second time this bird has occurred in Sussex, and the fourth time in this country.

October 6*th.*—A fine adult male of the White-spotted Bluethroat (*Cyanecula wolfi*), picked up dead under the lighthouse at Dungeness. It was exhibited by Mr. M. J. Nicoll at the British Ornithologists' Club on Oct. 22nd, and is probably the first authentic occurrence of this race of Bluethroat in this country (*vide* Bull. B. O. C. xci.; Zool. 1902, p. 464).

14*th.*—A young Glossy Ibis (*Plegadis falcinellus*) shot at East Guldeford in Romney Marsh.

25*th.*—A fine adult male Glossy Ibis (*P. falcinellus*) shot between Pevensey and Bexhill. A young male Spoonbill (*Platalea leucorodia*) was also shot on this date at Broomhill, in Romney Marsh. It was a very small bird. Mr. Chapman, of Rye, to whom the bird now belongs, informs me that it was shot just on the Sussex side of the Kent ditch. On this day also several Spotted Crakes were seen by a party of sportsmen near Rye, and one (a male bird) was obtained.

29*th.*—An immature female Water-Pipit (*Anthus spipoletta*) shot at Rye Harbour by Mr. M. J. Nicoll, and was exhibited on his behalf at the British Ornithologists' Club by Mr. Howard Saunders. It was a remarkably small specimen. This is the seventh record for this species in Sussex (*vide* Bull. B. O. C. xcii.).

November 7*th.*—An immature female Merlin (*Falco æsalon*) was shot at Ninfield by a man named Sergeant. It is now in my collection.

8*th.*—An immature Glossy Ibis (*Plegadis falcinellus*) shot between Pevensey and Eastbourne. This is probably the bird seen by Mr. A. H. Machell Cox at Pevensey Sluice on Nov. 6th, and reported by him in the 'Field' of Nov. 22nd.

12*th.*—A male Firecrest (*Regulus ignicapillus*) shot by Mr. M. J. Nicoll at Camber.

December 12*th.*—A female Kite (*Milvus ictinus*) trapped by a gardener between Battle and Robertsbridge; a second bird was also seen.

24th.—The second Kite (a male bird) was shot near Whatlington, and therefore had not wandered far from where its mate was trapped. The female is now in the collection of Fleetwood Ashburnham, Esq., of Broomham Park.

26th.—A female Two-barred Crossbill (*Loxia bifasciata*), shot by a Mr. H. Dale at Woodchurch, in Kent. It was a dull grey-brown bird, with a slight tinge of yellowish green on the flanks, and a poor specimen from being kept a long time before being skinned. It was exhibited on my behalf at the British Ornithologists' Club (*vide* Bull. B. O. C. xcv.).

February 3rd, 1903. — A male Bulwer's Petrel (*Bulweria bulweri*) picked up dead on the beach near Beachy Head after a succession of strong S.W. gales. It was seen by me in the flesh, and had evidently been dead several days. It was exhibited on my behalf at the British Ornithologists' Club (*vide* Bull. B.O.C. xcv.). This is only the second time that this Petrel has occurred in the British Isles.

April 27th.—An adult male Hen-Harrier (*Circus cyaneus*) shot at Fairlight.

May 13th.—An adult male Black-headed Wagtail (*Motacilla feldeggi*) and two males of the Grey-headed Wagtail (*M. borealis*) shot near Willingdon, Sussex. This is the first occurrence of the former in this country (*vide* Bull. B. O. C. xcviii.). An adult male Peregrine (*Falco peregrinus*) was also shot on Beachy Head on this date. Two others (both males) were also shot this year early in March at the same place.

21st.—A nest and five eggs of the Blue-headed Wagtail (*Motacilla flava*) was found by a man named Potter in his allotment-garden at Winchelsea. There were two pairs of birds seen, and it is to be hoped that the other pair hatched off successfully. It was in this same garden that the nest was found in 1901, as recorded in 'The Zoologist' (*q. v.* p. 389). The above nest was exhibited by me at the British Ornithologists' Club (*vide* Bull. B. O. C. xcix.).

30th.—A male Collared Pratincole (*Glareola pratincola*) shot by Mr. Southerden at Jury Gap, in Romney Marsh. It was seen by me in the flesh, and exhibited at the British Ornithologists' Club (*vide* Bull. B. O. C. xcix.). This is probably the first occurrence of this species in Kent.

June 1*st*.—A male Black-winged Pratincole (*G. melanoptera*) shot by Mr. F. Mills near Dungeness Point. This is the first occurrence of this species in the British Isles, and is recorded by me in the B. O. C. Bulletin, xcix.

These two Pratincoles are now in the collection of Mr. Fleetwood Ashburnham, at Broomham Park.

19*th*.—An adult female Squacco Heron (*Ardea ralloides*) shot near East Guldeford, in Romney Marsh.

22*nd*.—A second adult Squacco Heron (*A. ralloides*) shot between Icklesham and Winchelsea. These two specimens are the third and fourth that have been procured in this locality within ten months.

July 19*th*. — A female Black-winged Pratincole (*Glareola melanoptera*), in rather worn plumage, shot near Rye (*cf.* Zool. *ante*, p. 392).

August 24*th*.—An adult female Hobby (*Falco subbuteo*) shot at Ninfield. It was well on in the moult.

29*th*.—An immature female Solitary Snipe (*Gallinago major*) and two Green Sandpipers (*Totanus ochropus*) shot at Brede. During this month a number of Black Terns (*Hydrochelidon nigra*) were seen on the River Rother above Rye, and five were procured, all adult birds, which is rather unusual for this time of year, old birds being generally seen during the spring migration only. An Avocet (*Recurvirostra avocetta*) was also shot between Rye and Lydd.

September 11*th*.—An adult male and an immature Bluethroat (*Cyanecula suecica*) shot near Pett.

15*th*.—A second immature male Bluethroat shot at Pett.

In addition to the above record of the nesting of the Blue-headed Wagtail, I have to record the attempted nesting of Montagu's Harrier (*Circus cineraceus*), and the successful nesting of the Peregrine (*Falco peregrinus*).

The Harrier returned this year to its former haunt (which there is no need to further particularise) for the first time for ten years; but, as happened then, no sooner had incubation commenced than she went the way of all "vermin." So far as I know, the cock escaped, and it is to be hoped will succeed in finding a mate and returning next year, when perhaps better luck may attend them.

The Peregrine nested at a spot where, so far as I am aware, no Peregrine has ever nested before—at any rate, there is no record of the fact; but for obvious reasons the exact locality need not be made public. They successfully reared four young ones, and all six birds were seen on the wing on many occasions. Unfortunately two of the young were shot by a prowling gunner, but the others soon after took their departure. Having therefore been once successful, I trust they will return and rear full broods every year. At any rate, whether they do or not, steps will be taken to secure their safety both at this spot and on Beachy Head, where they evidently are in sore need of it.

ON THE NORTHERN BREEDING RANGE OF THE DARTFORD WARBLER, *SYLVIA UNDATA* (BODD.).

BY THE REV. F. C. R. JOURDAIN, M.A., M.B.O.U.

MR. H. E. FORREST's most interesting note (*ante*, p. 349) on the breeding of this species in the neighbourhood of Ludlow confirms the supposition that the northern breeding range of *S. undata* has hitherto been imperfectly known, and that further research may result in the discovery of new breeding haunts. Such a skulking and inconspicuous species is always liable to be overlooked even in well-worked localities. At the time of the publication of the fourth edition of 'Yarrell' it was not known to breed north of the Thames in any county except Middlesex. Since that time Prof. Newton has recorded his observations on its breeding habits in East Suffolk ('Ootheca Wolleyana,' p. 344, &c.), and Mr. Howard Saunders, in the second edition of his 'Manual' (1899), gives the following account of its distribution in the breeding season :—"It is known to breed in nearly all the southern counties from Cornwall to Kent inclusive, especially in Hampshire (and the Isle of Wight), Surrey, and Sussex; sparingly in the valley of the Thames, and perhaps in some of the midland counties, while it has been observed in Cambridgeshire, and undoubtedly nests in Suffolk and Norfolk." (It will be seen from the above extract that Mr. C. Dixon's account of the nesting of this species in the Rivelin Valley near Sheffield is not considered to be authenticated. No subsequent observer has, as far as I am aware, met with it in the neighbourhood.)

Mr. Forrest's information places the fact of its having bred in Shropshire in 1902 beyond dispute, and it will be seen that there is every reason to suppose that it has also nested in the neighbouring county of Stafford. It is included by Dr. McAldowie in his 'Birds of Staffordshire' (1893) as "occurring on Cannock Chase," on the authority of Mr. Yates, but no details are given, and until recently no confirmatory evidence was forthcoming.

However, last year I was informed, by Mr. J. Henderson, of Hinchley Wood, Mappleton, who lived for many years at Tixall, on the borders of Cannock Chase, that in or about 1870 he met with this bird for the first time, and found a nest with eggs among some bushes not far from the Shugborough Road. Having a butterfly-net in his hand at the time, he managed by a lucky stroke to capture the sitting bird, and took both bird and eggs to a friend, Mr. Mayne, who was naturally incredulous on being told that a Dartford Warbler's nest had been found, but the production of the nest, and, finally, the old bird, effectually convinced him. Mr. Henderson is a keen observer of birds, and has a distinct recollection of the peculiar throat and chest coloration which is so characteristic of this species at close quarters. Unfortunately he did not realize the importance of his capture, and took no steps to preserve the skin, or to publish any account of the occurrence.*

The most northerly locality where specimens of this species have been actually secured is Melbourne, in S. Derbyshire, where a pair were shot during the hard winter of 1840 from the top of a furze-bush half covered with snow (J. J. Briggs, Zool. p. 2486). F. B. Whitlock hazards the suggestion that these birds may have wandered from Charnwood Forest, but it is at least equally likely that they made their way down the gradual descent of the Trent Valley from Cannock Chase to Melbourne. It was by this route that the Red Grouse (which almost certainly came from the Chase) made their way down to the low-lying country between Tutbury and Derby in the winter of 1860–61, and heavy snow on the moors of North-west Derbyshire frequently drives them down the Dove Valley. Moreover, according to Mr. M. Browne, the Dartford Warbler has not occurred in Leicestershire.

That this bird wanders in winter to places remote from its usual haunts has long been known, and probably, like the Stonechat, its numbers are much diminished by a spell of severe weather. I have myself seen a pair within the precincts of the city of Oxford—hardly the place where one would naturally expect to meet with it—and other instances are on record of its turning up in unlikely places.

---

* Mr. Henderson's name will be familiar to students of Messrs. Harvie-Brown and Buckley's 'Fauna of Argyll and the Inner Hebrides,' as former lessee of the shooting of Tiree, and a contributor of ornithological notes to that volume.

It is satisfactory to know (as Mr. Forrest informs me) that the Ludlow colony consists of two pairs of birds, and that one pair managed to bring off their young.

Although much reduced in numbers of late years in many of its old breeding haunts in the south, I am glad to say that in one locality, at any rate, it is still an exceedingly common bird, and ten or fifteen pairs may be seen in a day; but up to the present the spot has remained practically unknown to egg-collectors, although a few birds are annually taken for cage purposes.

BIRD-LIFE ON AN INDIAN MARSH.

By Gordon Dalgliesh.

The marshes of Bengal are large tracts of land almost entirely covered with water after the rains, but which dry up to a certain extent in the hot weather, leaving behind deep pools, which are covered with beautiful water-lilies and bordered with rushes. Rice is grown around the edge and in the shallow water, and affords both food and shelter to all kinds of wildfowl.

A favourite haunt and shooting-ground of mine was such a marsh that was situated close to the Tirhoot State Railway. Standing on a road that ran alongside the marsh, at sunset, one heard the whistle and rush of many wings, caused by the huge flocks of Duck which came to feed on the rice. The natives used to snare these Duck and other birds by stretching long nets hung between two poles, and on dark nights the birds, flying low over the water, got entangled in the meshes, and were so found in the morning, when they were taken away and sold alive in the bazaars.

The commonest of all birds on these marshes were the Coots (*Fulica atra*), which simply swarmed in thousands, a few pairs remaining to breed in the hot weather. A great enemy to these birds was Pallas's Fishing Eagle (*Haliaëtus leucocoryphus*), and many a Coot have I seen carried off by this robber to feed two voracious young in a nest situated in a neighbouring simul-tree.

One of the handsomest of all the migratory Ducks was the Red-crested Pochard (*Netta rufina*). A curious fact I noticed about this bird, was, that one always invariably came across large flocks consisting only of males, and small flocks of only females, though of course at times they became mixed.

Keeping very much to the shelter of the rushes, and never wandering far from them, were small flocks of White-eyed Pochards (*Nyroca ferruginea*), which was, with the Gadwall (*Chaulelasmus streperus*), the commonest Duck on this marsh.

As a rule they were tame compared with other fowl, and one was pretty certain of bagging a couple or so out of every flock that came across. One summer I kept a number of these Duck in an aviary, in the hope that they would breed, but in this I was disappointed.

On several occasions I came across the pretty little Tufted Duck (*Nyroca fuligula*), but for some unknown reason they were very irregular in their migrations, and in some years were almost common, while in the next year perhaps not one would be seen. When rising off the water they skim the surface like a Coot, and dive rather than fly when danger threatens them.

The Pintail (*Dafila acuta*) was the wariest of all the Ducks. After firing a shot they would rise up right out of range, and, after circling round once or twice, would fly away, to return no more until all was quiet again. During the cold season of 1897–98 these Duck came in such enormous flocks as to cause considerable damage to the rice-crops. I once or twice came across the Shoveler (*Spatula clypeata*), and on those occasions found it far less shy than many other fowl, and when wounded did not resort to diving. The flesh of the Shoveler is always said to be rank and fishy in flavour. I certainly did not find this the case; the ones I ate were delicious.

Both the Cotton Teal (*Nettopus coromandelianus*) and small Whistling Duck (*Dendrocycna javanica*) were common and resident on the marsh. In some places I have seen the latter bird in flocks of hundreds; indeed, it was a marvel to me where they all came from. Both these species are good divers, and are seldom recovered if "winged." Early one morning in December I came across a couple of Barred-headed Geese (*Anser indicus*) feeding in the stubble.

I remember one bitterly cold morning in December arriving at the marsh for a shoot at 4 a.m. The day was just dawning, and clouds of mist were rising off the water. The first bird I noticed was a Great Crested Grebe (*Podicipes cristatus*), which looked twice its real size in the weird grey morning light. After chasing it about the water for an hour and a half (trying to get within range, which I could not do on account of its repeated dives), I bagged it—a fine male. This was the only one I got. There were two more, which I tried for another day, but failed

to obtain. The diving powers of these birds are astonishing. I know of no bird that can touch them in this (except, of course, the big sea-divers), though Hume says the Smew dives even better. I doubt it.

The Little Grebe (*P. albipennis*) was a common resident, and bred during July and August. The Purple Moorhen (*Porphyrio poliocephalus*) was common, and in August constructed huge nests of paddy or rice. The pretty little Water Pheasant (*Hydrophasianus chirurgus*), whose plaintive mewing cry must be familiar to all Bengal sportsmen, was plentiful, and made a nest amid the lotus leaves and rice.

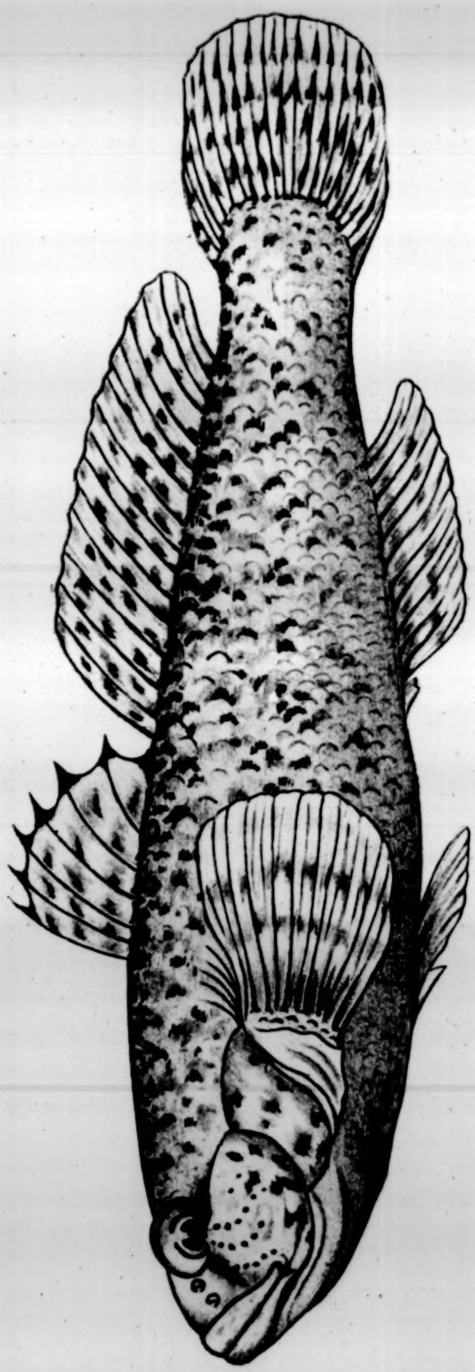
Fishing near the shallows were numerous species of Terns, the most common being the Whiskered Tern (*Hydrochelidon hybrida*), which bred somewhere near at hand. Feeding on the mud were numerous small Waders, as Sandpipers, Black-winged Stilts, &c. Once or twice I have shot Curlews, but they were very shy and difficult to approach, and always had a sentinel posted to warn them of any danger or suspicious object.

Three species of Snipe are found here: the Common Snipe (*Gallinago cœlestis*), the Pintail (*G. sternura*), and the little "Jack" (*G. gallinula*).

One of the most familiar of all Indian birds is the little Pond Heron, or Paddy Bird (*Ardeola grayi*), and is to be found quietly fishing by nearly every piece of water. I once had the good fortune to secure the Great White Heron (*Herodias alba*). I never came across another. It was by this marsh that I first made the acquaintance of the Bittern (*Botaurus stellaris*), and narrowly escaped having my hand run through with its powerful bill, when I went to pick it up after shooting, before it was dead.

Kingfishers of four species are met with, namely, our own *Alcedo ispida*, the White-breasted Kingfisher (*Halcyon smyrnensis*), the Stork-billed (*Pelargopsis gurial*), and Pied Kingfisher (*Ceryle varia*). The last-named species catches its prey like a Kestrel, first hovering over it, and then, with a quick downward plunge, securing the fish, which it swallows while on the wing.

Plate VIII.



THE GIANT GOBY; *Gobius capito*, C. & V.

THE GIANT GOBY (*GOBIUS CAPITO*, C. & V.).

By Frederick Pickard-Cambridge, F.Z.S.

(Plate VIII.)

In 'The Zoologist' for 1899 (p. 429) an editorial note refers to the discovery of this magnificent fish on the coast of Brittany by Mr. G. A. Boulenger, a species which had hitherto been taken only in the Mediterranean. It was remarked by the captor at that time that in all probability this Goby would also be found in the South of England, presumably off the coast of Cornwall; for Couch, who lived at Polperro, spoke of *Gobius niger* attaining the length of 9–10 in., and being confined to rock-pools. The true *G. niger*, as usually identified by authors, however, never attains a greater length than 5 in. With the object of finding out if possible what this big Goby might be, at Mr. Boulenger's suggestion I hunted the rock-pools in the vicinity of Port Scatho, between Falmouth and Fowey, in Cornwall, where I happened to be during August and September of this year.

The result was highly gratifying, for the Giant Goby was there in plenty, both large and small. It is certainly strange that Couch should not have distinguished between this fish and the Black Goby, for the same characters distinguish it from this species as serve for a distinction between the Black Goby and the Rock Goby (*G. paganellus*); and Couch was well acquainted with the distinctive characters in the latter case. Couch's figure of the Black Goby (*G. niger*) is obviously taken from one of these large rock-pool Gobies.

The discovery of this new British fish in Cornwall shows how much there is still to be done in identifying species of fish and ascertaining their distribution, apart from the question of their habits and foodstuffs. Messrs. Holt and Byrne have published a most excellent monograph on the British Gobies, but unfortunately the recognition of the Giant Goby in British waters was not made in time for its inclusion in that work, only issued at the beginning of the year.

[We have to thank the publishers of the 'Field' for their courtesy in lending us the block to illustrate this paper.—Ed.]

NOTES AND QUERIES.

MAMMALIA.

Lesser Horseshoe Bat (Rhinolophus hipposiderus) in Carnarvonshire.—As the distribution of the Lesser Horseshoe Bat is still imperfectly known, it may be of interest to record the occurrence of the species in Carnarvonshire. I have recently seen an example which was taken on Sept. 24th near Tal-y-Bont. The Bat was hanging with about a dozen others of the same species to the roof of a cave on the bank of the Afon Dulyn, a tributary of the Conway.—CHAS. OLDHAM (Knutsford).

Blind Rats and Mice.—In cutting peas in one of my fields here on August 3rd, five young Rats, estimated at about a month old, were killed, and a short distance off a pregnant doe Rat, which was probably their mother. The doe and one of the young ones were in normal condition, but the other four were blind of both eyes; in one instance one of the eyes was gone, and the lids had coalesced, requiring considerable force to separate them, showing the injury was of some days' standing. The only explanation I can suggest is that this was the work of a pair of Red-backed Shrikes which were nesting in an adjoining hedge, in the same way that Magpies and Jays treat Rabbits; but the pea-haulm afforded excellent cover, and it is remarkable that within the few days which can only have elapsed since the young Rats first left the nest the butcher-birds should have succeeded in pecking both eyes of four individuals, which subsequently escaped them. The only other explanation that occurs to me is to ask whether there is any beetle or other invertebrate of any sort known which attacks the eyes of nestling small mammals? One occasionally meets with an adult Rat blind of one eye, but that I have always attributed to one or other of the many accidents that Rat-flesh is heir to—such as wounded by man, by shot, or stick, or fighting one of its own species. At my old home at Great Marlow I met with hundreds of Mice blind of one or both eyes. Many years ago an Iceland pony which I imported went blind, and it seems just possible that the form of ophthalmia from which he suffered may have been contagious, and have communicated itself to the Mice. Certainly at first the blind specimens were all captured in or round the stables, but later they were obtained from all parts of the garden, and the house itself; but no other Horse or other animal suffered, and I am not sure of the date when I first began noticing these blind Mice. — ALFRED HENEAGE COCKS.

AVES.

British Examples of the White-spotted Bluethroat.—Under this heading (*ante*, p. 23), Mr. T. H. Nelson writes that the first British-killed example of this Bluethroat was obtained at Scarborough, and described by the Rev. J. G. Tuck (Zool., June, 1876, p. 4956). On referring to this note I find that a specimen of the bird was picked up under the telegraph-wires near Scarborough on April 12th, 1876. It was described by Mr. Tuck as a female bird, and containing well-developed eggs. If Mr. Nelson will refer to Dresser's 'Manual of Palæarctic Birds' (1902), p. 62, he will find that Mr. Dresser, in describing the female of the Red-spotted Bluethroat, says that the female and young resemble those of the White-spotted form, "there being no character by which they are distinguishable.". At the end of his note Mr. Tuck says that only one other individual of this type is recorded as having been met with in Britain. I may as well mention here that this was the example supposed by Mr. Hancock to have been taken near London in May, 1845. It was, however, purchased from a dealer whose traffic with Holland was notorious (*cf.* Saunders's 'Manual of British Birds,' 1st edit. (1889)). I think I am therefore justified in saying that the bird I exhibited at a meeting of the B. O. C. last October, and recorded in 'The Zoologist,' is the first authentic British example of the White-spotted Bluethroat.—MICHAEL J. NICOLL (10, Charles Road, St. Leonards).

Tawny Pipits (Anthus campestris) in Sussex.—At the one hundredth meeting of the B. O. C., held on Oct. 21st, I exhibited two pairs of Tawny Pipits, which I shot at Rye Harbour, in Sussex. I obtained the first pair on Sept. 22nd; they were feeding on a stretch of swampy ground which had just been left bare by the falling tide, in company with a large flock of Meadow-Pipits. Their note was a soft double chirp, not unlike that of a Linnet. On Sept. 24th, at the same place, I met another pair, which, like the former, were in immature plumage, though all were just beginning to get a few new feathers on the upper parts. They appeared very pale in coloration when alive, and walked very upright. There have been about nineteen previous records of this species in Sussex, in which county most of the British examples of this bird have been taken. Probably numbers of others have been overlooked, as amongst the large numbers of Meadow-Pipits (*Anthus pratensis*) which appear on our south coast during September it is quite likely there are many rare Pipits such as *A. cervinus* every year.

At the same meeting of the B. O. C. I exhibited an adult male Great Reed-Warbler (*Acrocephalus turdoides*), which I shot on Sept. 25th on a disused brickfield close to the West St. Leonards Railway Station. I first saw it feeding at the top of some sallow-bushes, but on finding itself observed it became very skulking, and it was not till an hour later that I rediscovered it in a bed of nettles, and shot it. The tarsi and toes of this specimen were dark slate-grey, and its gizzard contained earwigs. As Mr. Howard Saunders remarks ('Man. Brit. Birds,' p. 83), it is curious that this species, which is so common on the Continent, should so seldom visit our shores. Its size alone would at once attract attention. The bird I shot uttered no note, but it was plainly visible at a distance as it hopped about the bushes, and looks like a very large Garden-Warbler. This is the fifth authentic record of this bird in Britain, and the first in Sussex, for although Mr. Borrer ('Birds of Sussex,' p. 64) mentions a bird having been seen which was believed to be this species, it was not obtained. — M. J. Nicoll (10, Charles Road, St. Leonards).

Goldfinch (Carduelis elegans) in South Africa.—A few months ago there appeared in our pages (*ante*, p. 227) a statement made by a Mr. Barton, of the Suffolk Regiment, that Goldfinches were common halfway up the hills at Heidelberg, in the Transvaal, and were breeding there. I thought it best to add a qualifying note to this record, as it was against my own experience in the Transvaal, and I stated that I had written to that country, and to that locality, for further information on the matter. Mr. F. G. Nicholson, who then resided at Standerton, within easy distance of Heidelberg, replied:—"I have seen no Goldfinches near Standerton or Heidelberg, and am of opinion that even though the soldier mentioned did capture them, they must have but recently escaped from confinement." He added he was making further inquiries, and I have just received another letter from him on the subject, in which he says:—"I have done all I can, and have interviewed Heidelbergians, but can find no confirmation of the story." Mr. A. Ross, of Johannesburg, also gives me the same negative information. I therefore think that the presence of the Goldfinch in a wild state either at Heidelberg or any other district of the Transvaal can be considered as a record probably based on hasty and inexperienced observation.—W. L. Distant.

Cuckoo calling in July.—Whilst at a bowling party at Stalham on Aug. 17th ult. a Cuckoo flew across the green; one of the players thereupon told me that he had heard one calling in the Broad district on Aug. 13th. From my own notes I cull the following:—Earliest appearance, W. Rudham, Norfolk, April 13th, 1891. Latest seen, Potter Heigham, Norfolk, Sept. 25th, 1901. Earliest egg (Greenfinch nest), Canvey Island, Essex, May 8th, 1882. Latest egg (Wagtail's nest), Hickling, Norfolk, July 7th, 1899. Latest calling, July 8th, 1891; Brunstead, Norfolk. How late the Wood-Pigeons are breeding this autumn! On Sept. 19th there were eggs still unhatched at Catfield. Shooting there on Sept. 21st, my dog brought me an unfledged squab from a very low nest in an alder-stub, and our "bag" included eleven with particles of down still adhering to their neck-feathers, and nineteen such were accounted for at Horning on the following day. My log-book, however, reminds me that I handled a "brancher" of this prolific species on Dec. 2nd, 1886.—Maurice C. H. Bird (Brunstead Rectory, Stalham).

An October Cuckoo.—The occurrence of a Cuckoo in October seems almost as improbable as the oft-repeated story of the Cuckoo in March, but my friend the Rev. H. A. Harris, of Aldeburgh, came to me for a night on Oct. 1st, and assured me that a young Cuckoo was still frequenting some of the gardens in that town. On Oct. 7th he wrote to me:—"I have to-day again seen the Cuckoo. I followed him up and got quite near him in a garden close to our house. He perched on the ground, or rather on a heap of garden-refuse, and began to eat what I think were cabbage-butterfly caterpillars, of which there were a great number crawling about seeking some place to spin up in. He was very dark indeed; even the neck and chest were a dark cigar-ash colour, and the abdomen was barred with reddish brown."—Julian G. Tuck (Tostock Rectory, Bury St. Edmunds).

Large Flight of Rough-legged Buzzards near Scarborough.—On Oct. 16th about a dozen Rough-legged Buzzards (*Buteo lagopus*) were seen hovering about on the moor near to the racecourse; four fine birds were secured, and the remainder are now scattered about the locality, some having since been seen in the carrs, others on the wolds, and on the cliffs. The following birds have also been captured near Scarborough, *viz.* a fine mature male Peregrine Falcon, Little Gull, Crossbill, Black Tern, and a fine variety of pied Stock-Dove.—J. Morley (King Street, Scarborough).

Strange behaviour of Peregrines in Ireland.—We have received from Mr. A. H. Evans, of Cambridge, the following very interesting letter from one of his correspondents:—

"Probably you may remember leaving your address with me when here with Mr. Ussher last April; as I intended writing you, with a view to your obtaining me a purchaser for the young Peregrine hawks, if the gentleman who usually took them from me did not want them this year. The nest, as I will relate, was very unfortunate. You will remember Mr. Ussher going to it, and reporting 'three eggs, one a beautifully marked one.' Four or five days after, I noticed what I thought was a strange Peregrine on the cliff in which the Raven bred. After starting it from its perch, it arose in the air, when the local tiercel suddenly made its appearance, and after some slight aerial encounters the two birds flew inland, one apparently in pursuit of the other. I said to myself, this is evidently either a strange Hawk, or else the Falcon must have forsaken her nest in the adjoining cliff; so I will take a run over and have a look. I went across directly, and found the Falcon sitting snugly on the nest, when I became certain that a strange Hawk was around. I went on the morrow to the cliff on which I saw the strange Hawk the preceding day, and, peering cautiously over the cliff-top, I saw this bird on a jutting crag, looking like an immense Falcon; while, singular to tell, almost the exact spot on which she stood was a breeding-site of the local Peregrines from which I saw Mr. Ussher take eggs some twelve years ago, and from which I took young Peregrines some six years previously. After straightening myself up, the Falcon at once saw me, and, with loud screams, took wing and flew away; but I came again late in the evening of the same day, and found her roosting in the cliff. Next day I saw the local tiercel and herself having those aerial encounters again, and I could hear the Falcon emitting those wild cries peculiar to the bird at the beginning of the breeding season. I then went across to the breeding-site, and found the local Falcon sitting all right on the nest. A day or two after I found two Peregrines (I had the glass with me) sitting on the wall of the old ruin (which, you may remember, overlooked the Raven's nest) within four yards of each other, and apparently on friendly terms. My curiosity was aroused, so I hurried across to the breeding-site of the Peregrines, from which I could command both a view of the nest and of the two birds at the same time. On the nest I still found the Falcon sitting tightly, when I thought this tiercel of mine is fast becoming a polygamous bird, and evidently intends presenting me with another clutch of young Peregrines this season. A few days passed, and I paid another visit to the breeding-site. I had the glass with me, but scan the nest as I would, I could not discern a trace of the Falcon; and I went next day, with a like result. I was completely surprised and nonplussed at the absence of the bird at such a critical stage of the incubation, which was somewhere about the last week in April. Next morning my servant was out doing some work by the cliff-side, and on his return he told me he had seen a great fight between the two big Hawks (*i.e.* the Peregrines), that they clawed each other in the air, and were both falling into the sea when they separated. One flew upward, and the other fell into the sea, but after striking the water it rebounded again, and, flying shoreward for some yards, fell again into the sea, when it commenced flopping and floundering towards the shore, which it reached after much ado, and in a most bedraggled condition. The place which the bird reached cannot strictly be called 'the shore,' as deep water is there at every stage of the tide, but there are shelves at the base of this particular cliff, from which the sea recedes at low water, and on which an incoming wave floated the poor bird. I made a search for the bird a short time afterwards, but without result. Probably the tide, which flowed in the meantime, must have carried the Hawk away.

My theory of the whole matter is this. The strange Falcon must have ultimately seduced the local tiercel from his allegiance to his mate, and the latter remained on the eggs forlorn, until hunger compelled her to go foraging for herself. She must have been on one of these foraging expeditions when she chanced to fall in with her rival, and, as she was weakened by starvation and worn out by her long period of incubation, her rival easily overcame and vanquished her. I intended going down to the nest to see how matters stood there, but as I was expecting Mr. Ussher, I put off the visit until he came, about a fortnight after. I told him all I have written, and thought he might like to go down and see the nest. He was, however, suffering from a sore knee, and could not go. I then proposed to go myself, as I was really anxious to see how the eggs fared. Mr. Ussher said I would probably get no eggs, as the Grey Crows would have carried them off. I went down, and found only two eggs, very much discoloured and stone-cold. So thus fared the Peregrines' nest this season. I have to apologise for asking you to wade through this tedious letter, but I thought the circumstances of the case rather novel, and that you might like to learn the whole details. I hope you will keep me in mind as regards a sale for the young Peregrines next season, as I may have occasion to write to you.—P. Gough (Island-Stradbally, Portlaw, Ireland)."

Sabine's Gull in Yorkshire.—Another Sabine's Gull (*Xema sabinii*) was shot in Bridlington Bay on Oct. 7th, and received here in the flesh two days later. This one was a bird of the year, and except for the black-tipped tail much resembles a young Black Tern in plumage. It makes up five in all (four adults) obtained on the Yorkshire coast in less than six weeks, while probably others have been sent away with Terns for millinery purposes.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

Was it a Great Auk??—I have under me a Finn, who is a great hunter, trapper, &c., and who is well acquainted with all sea-birds, Mammalia, and everything else pertaining to these parts. The man, knowing that I am greatly interested in ornithology, came to me one day and said, in his broken Norsk, that he had seen a bird swimming and diving about in the bay which he had never seen before. It was, he said, quite tame, and was close in to the wharf. He described it as nearly all black, and with a big beak, but not a beak like the Cormorant, but more like a "Lunde" or Puffin. I thought at once of the Great Northern Diver, but on showing him the figure in 'Yarrell' he laughed, and said it was a bigger bird; and besides, he knew the Diver, and told me at once there were two, one small and one large. I showed him *Alca impennis*, and he said that was just like it, only he did not see any white on it. This, if swimming, is possible. He would have gone for his gun, but did not like to do so in work hours. I cannot say I regret that he did not. I give you this for what it is worth. I know the man well, and that he could have no possible object or inclination to concoct a tale. I have found all his information absolutely reliable. — H. A. A. DOMBRAIN (British Vice-Consul, Brettesness, Lofoten).

Notes from Lincolnshire.—The following birds are in the hands of Mr. Nash, of Lincoln, for preservation. All of them were obtained between Sept. 20th and 29th near the outfall of the River Welland:—Black-tailed Godwit (*Limosa belgica*), male; Spotted Redshank (*Totanus fuscus*); Reeve (*Machetes pugnax*), immature; and Red-necked Phalarope (*Phalaropus hyperboreus*), male, immature. — F. L. BLATHWAYT (5, Monks Leys Terrace, Lincoln).

NOTICES OF NEW BOOKS.

A Treatise on Zoology. Edited by E. Ray Lankester, M.A., LL.D., F.R.S., &c. Part I. Introduction and Protozoa. Sec. Fascic. by J. B. Farmer, D.Sc., J. J. Lister, M.A., E. A. Minchin, M.A., and S. J. Hickson, F.R.S. Adam & Charles Black.

The term "serious students" is probably exact, but too suggestive; we may propose "real students," and all such will appreciate another volume of this advanced series. It is not addressed to the collector of natural history curios, nor specially to the bionomical observers who are the salt of the pages of this Journal; but it contributes to the faith and evidence for a qualified biologist. It is one of the strongest volumes yet issued, and the opening chapter (continuation of Protozoa) on "The Structure of Animal and Vegetable Cells," by Prof. J. B. Farmer, is a contribution to the knowledge necessary for a real recognition of the "something" which makes for evolution. It is in such minute studies that we can almost watch the earliest pulsations of life.

Dr. Lister writes on the Foraminifera, a treatise which Prof. Ray Lankester states "contains much that is new and original." It is probable that, to the general reader, the order *Globigerinidea* of this Class is best known, and that owing to the classical lecture by Huxley "On a piece of Chalk." Dr. Lister will guide those who wish to travel farther in this study. Perhaps the subject which will attract most modern students is that of the Sporozoa, written by Prof. Minchin. The Sporozoa are always with us. "There is perhaps no species of annelid, mollusc, arthropod, or vertebrate which is not liable to become the host of some kind of sporozoan parasite—at any rate in certain localities—while many animals harbour several species of these intruders at the same time." Sometimes their presence is almost unnoticed, but in other cases they "produce dangerous or even fatal diseases, and may be the cause of ravaging epidemics." The Sporozoa have even been suspected as a cause of that cruellest of human maladies—cancer, and hence these parasites are individually and collectively enemies to the human race, to be studied and ever combated by biologists and pathologists; thus the importance of Prof. Minchin's treatise can scarcely be overestimated. The Infusoria by Prof. Hickson is the last contribution to the volume. We remember as a boy, in the early sixties, turning over the pages of 'Pritchard's Infusoria,' without much appreciable profit or enlightenment, save the charm and awe which such publications impress on the juvenile mind. These pages impress us with the different information that is now so readily attainable, and inspire an optimism as to the advance of biology by future generations.

We hear much of evolution in these days; it has almost become a catch-word, and a text for a ready speaker, but how few have really assimilated the idea, or understood the proposition! A student of these volumes can fortunately find much of the evidence on which the evolutionary doctrine rests, and thus obtain a real grasp of the greatest of human conceptions.

A Manual of Palæarctic Birds. By H. E. Dresser, F.L.S., F.Z.S., &c. Published by the Author at 3, Hanover Square, W.

Dresser's 'Birds of Europe' is a recognized classic in ornithology, but it is necessarily a costly book, above the means of many; and, again, its bulky volumes constitute a library book, quite unsuited for the travelling naturalist. We therefore welcome this Manual, which not only gives us the essence of the larger work, but something more as well; for Mr. Dresser has now taken under his purview the birds of the whole Palæarctic region, and in defining this region he has allowed himself considerable latitude in drawing its southern boundary. Africa has offered no difficulty, for the Sahara is all-sufficient there; but when we come to Asia authorities disagree. The author of this Manual defines the southern limits of the region as running northward of the Arabian Desert, including the tableland of Persia, the highlands of Baluchistan, the whole of Afghanistan, and the Himalayan Range above about 6000 ft., stretching to the south of Tibet, and north of the valley of Yang-tse-kiang as far as the Pacific, and then round Corea and the main islands of Japan. This is doubtless a good working Palæarctic proposal, though the inclusion of the Himalayas is perhaps more novel, and Japan, though orthodox, possesses a considerable Oriental element. Consequently this work is valuable as covering a very wlde and interesting area.

We have been impressed, in consulting these pages, by the wealth of bionomical information that is afforded beyond the necessary guidance to the identification of the species. In addition to the range of dispersal, we have the wintering quarters of most of the migratory species, and details of the call-note, song, food, habits, and nidification. Another very strong point is the list of common or trivial names under which the bird is known in its different habitats, an enumeration much fuller than any other with which we are acquainted, and which must prove of the greatest value to the comparative philologist as well as to travelling or field naturalists.

The absence of trinomialism in nomenclature is a prominent, and, to many, a most welcome feature in these pages; subspecies are admitted when they appertain to the rank of what some style in preference "local races," but we notice that the author prefers to give a separate number to these, as is applied to distinct species. Some difficulty is in this way created in estimating the whole enumeration. Thus *Acredula caudata* is numbered 223, and the following six subspecies are also numbered 224–229.

It is quite a relief to be able to demur to a single method in such a publication. It is a *vade mecum* for the Palæarctic ornithologist, and may well be placed between Newton's 'Dictionary' and Saunders's 'Manual.'

Observations of a Naturalist in the Pacific between 1896 and 1899. Vol. I. Vanua Levu, Fiji; a description of its leading Physical and Geological Characters. By H. B. GUPPY, M.B., F.R.S.E. Macmillan & Co., Lim.

THIS volume is entirely devoted to an exhaustive dissertation on the geology of the island, but its interest, although primarily geological, indirectly refers to some of the most disputed points in the discussion of zoo-geographical distribution. Dr. Guppy tells us that his investigations were largely connected with the study of plant-distribution, the details of which are promised in a second volume. It is probable that no real knowledge of a fauna or flora is possible without some acquaintance with the geology of the floor on which they flourish, and it is more than probable that the biology of the future will embrace a much larger geological consideration than it does at present.

Dr. Guppy has his own views and forms his own conclusions on the debatable question of submerged continents; he is convinced that "islands have always been islands"; he denies that there is any evidence that the various islands of the Fiji Group were ever amalgamated, or that they were ever joined to the Solomon Group. He thus gives no support to the hypothesis of a Pacific Continent, nor to the theory of a Melanesian Plateau. He advocates the view that these islands are due to "emergence," which has been in operation probably since the later Tertiary period, and is even now not suspended. Such an argument, it is, however, admitted, cannot apply to Hawaii in the North Pacific, which exhibits no evidence of emergence, and bears the impress of antiquity by the number of its endemic plants and animals, and his hypothesis must therefore be confined to the southern portion of the tropical Pacific. Consequently the fauna and flora of the Fijis must be considered as due to derivative migration, and not to the survivors of an older and submerged continent. Beyond the work of ocean currents, Dr. Guppy refers much to the direct agency of birds, more particularly as to plant distribution, but for proofs and details on this question we must await the publication of the second volume.

Whether these views are generally accepted, or the reverse, there can be no doubt that this volume affords a brilliant example of the way in which a purely geological study can be made the preface for the most important zoological discussion.

BRITISH 18 NO 1903 MUSEUM